Congestion measurement under different policy objectives: an analysis of Chinese industry

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Abstract: In recent years, the economic performance of Chinese industry has improved significantly; however, the congestion caused by excessive investment has plagued its sustainable development. In order to make full use of resources, it is necessary for the Chinese government to measure industrial congestion from different perspectives. However, most studies for measuring congestion only consider desirable outputs, even if, in practice, these are always accompanied by undesirable outputs. In this paper, three policy objectives are proposed for industrial development in China: the economic priority, the environmental priority, and the economic and environmental win-win. Three new data envelopment analysis (DEA) models with undesirable outputs were built for measuring undesirable congestion, desirable congestion, and double-congestion, respectively, for these policy objectives. These approaches can, not only identify congestion situation, but also calculate the total amount of congestion, and were applied to an analysis of the congestion of regional industries in China. Results show that most regions have some form of longstanding input congestion under different policy objectives, with this resulting in serious waste of resources. Based on the results obtained, some suggestions for sustainable industrial development in China are proposed.

Keywords: Data envelopment analysis (DEA); undesirable outputs; congestion; Chinese industry.